Mohit Garg.

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- December 2017

B. Tech VIIth Semester

COURSE CODE: 17B1WEC733 MAX. MARKS: 25

COURSE NAME: **ROBOTIC SYSTEMS AND CONTROL**

COURSE CREDITS: 3 MAX. TIME: 1.5 hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. ***Make valid assumptions if required.***

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1. **[7 marks] Derive the mathematical model of the PMDC motor. Draw a block diagram of linear control of robot manipulator and explain it.**

2. **[8 marks] Design a PID compensator for the regulation problem of robot manipulator. Perform the steady-state error analysis using PID control scheme. Explain all the advantages of PID over PD compensator.**

3. **[4 marks] What are the control issues in robotic control? Explain point-to-point motion and trajectory tracking problem.**

4. **[1.5 marks each] Write short notes on:**

   a. **Servomechanism**

   b. **Gear reduction**

   c. **Zeigler-Nichols tuning method**

   d. **Euler-Lagrange approach**